Demon 2

12 bit de-embedding monitor

USER MANUAL

Crystal Vision

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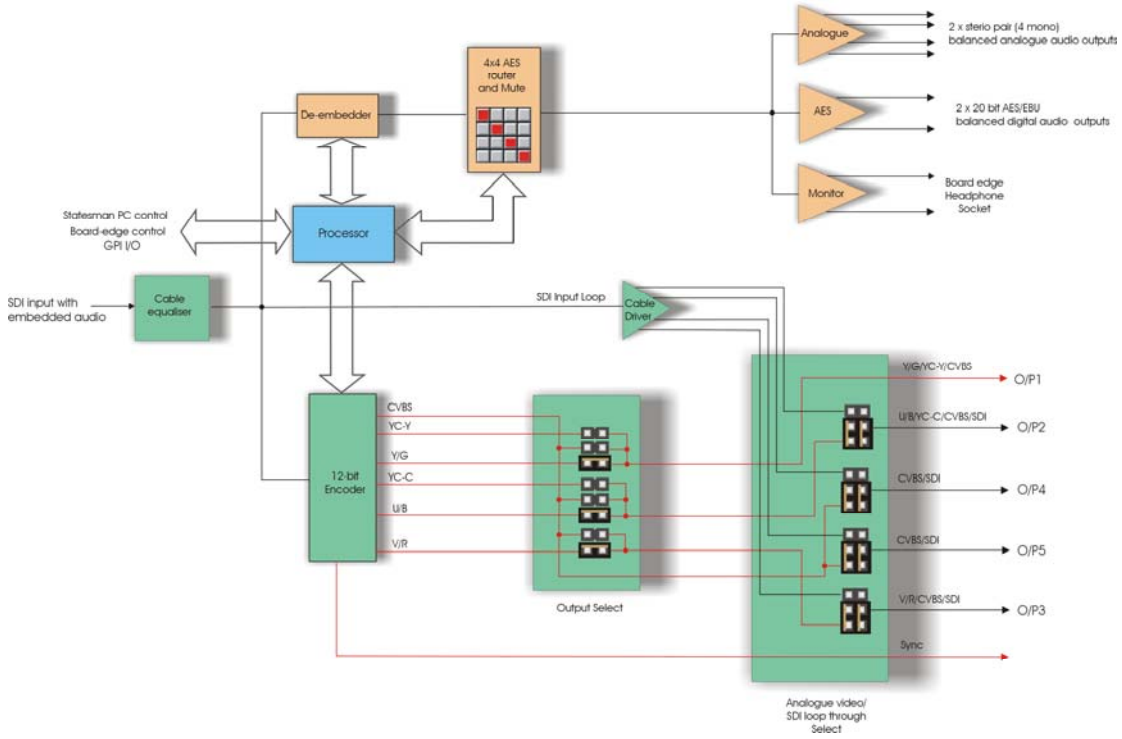
Revision 1	RM36 information added.	16/03/07
Revision 2	RM36 connection information amended	09/01/08
Revision 3	Specifications updated	23/02/12
Revision 4	RM04 label details changed, page 7.	08/08/12

1 Introduction

Demon 2 is a de-embedding monitor designed for applications requiring the simultaneous monitoring of video and embedded audio that can convert incoming SDI with embedded audio into combinations of component, composite, Y/C and SDI distribution, along with 20 bit AES and analogue audio.

The on-board 12-bit monitoring video encoder can be configured to produce a variety of video outputs. The four output formats available from the encoder are GBR with sync on all, YUV with sync on Y, S-video and composite in either 625 line or 525. A combination of these outputs will be available depending on Mode and rear module selection.



Demon 2 de-embedding monitor

Analogue video outputs may also be substituted for up to four non-reclocked SDI input loop-throughs.

Any one of the four audio groups contained in the SDI stream can be de-embedded and the resulting four channels of audio then be routed to any of the four audio outputs.

The output audio is available simultaneously as four mono (two stereo) balanced analogue and two balanced or unbalanced AES, depending on the rear module. Audio monitoring is available via the mini headphone socket located on the front board edge.

Sixteen presets allow you to store and recall parameters such as video output configurations, audio routing and audio group selection.

Demon 2 uses the same sophisticated techniques employed in TANDEM to protect and minimise the effects of cuts to untimed and asynchronous SDI, SDI corruption and TRS loss in the SDI signal. The Demon 2 will also report a frozen or black video input and EDH errors.

The main features are as follows:

- SDI audio/video monitoring encoder
- Up to five simultaneous video outputs – RGB, YUV, Y/C, Composite and SDI depending on rear module and link selection.
- Automatic 525/625 input switching
- Video error detection and alarm
- Sophisticated error handling of upstream input switching
- Simultaneous analogue and AES/EBU audio outputs from any one incoming embedded audio group
- 4 x 4 audio router to select any de-embedded channel to any output
- Dedicated headphone monitoring socket
- Flexible yet simple remote control and/or board edge control
- Sixteen presets recallable by GPIs and Demon control

Demon 2 is a 100mm x 266mm module, which fits in all standard frames and can be integrated with any boards from the company's full product range.

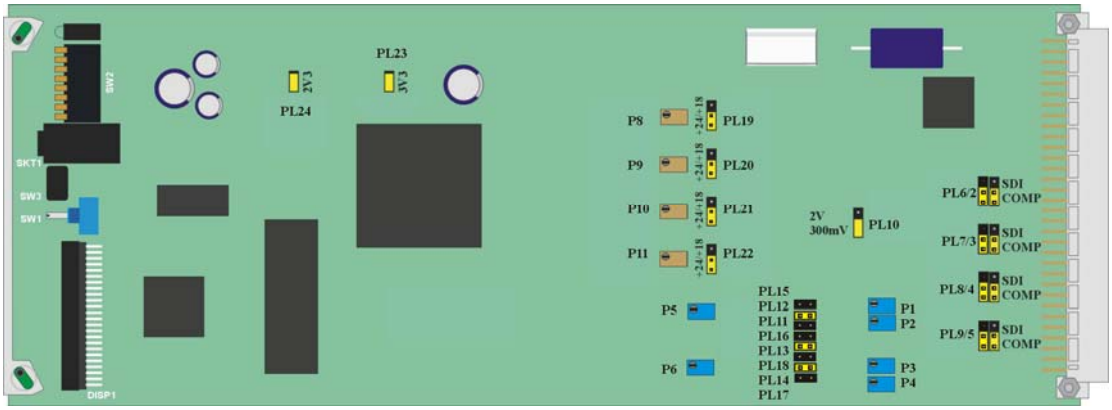
Demon 2 can be used with the RM04, RM05, RM06, RM22 and RM36 frame rear modules, depending on the packing density and outputs required. SDI input loop-through/analogue video outputs are selected by movable links on the board.

Demon 2 is particularly ideal for multi-channel broadcasters faced with many embedded feeds to monitor, or for applications needing to de-embed both analogue and digital audio at the same time. Demon 2 can also be incorporated with an Indigo DT desktop box to drive a plasma or CRT display and active speakers for local audio de-embedding and extraction of analogue video.

2 Hardware installation

The Demon 2 single height module can be used with the RM04, RM05, RM06, RM22 and RM36 rear connectors that will fit into all Crystal Vision rack frames (RM05 – not 1U frames). All modules can be connected or removed while the frame is powered, without damaging the board.

2.1 Demon 2 configuration



Demon 2 board showing configuration jumpers

Link positions (Video)

Link	Function	Link 1-2	Link 2-3
PL10	Video sync level	300mV p-p into 75Ω	approx2V p-p into 75Ω
***PL6/2**	O/P2 select	Analogue	SDI loop-through
***PL7/3**	O/P4 select	Analogue	SDI loop-through
***PL8/4**	O/P5 select	Analogue	SDI loop-through
***PL9/5**	O/P3 select	Analogue	SDI loop-through
PL15	O/P1 configure	YC-Y	
PL12	O/P1 configure	CVBS	
PL11	O/P1 configure	G/Y	
PL16	O/P2 configure	YC-C	
PL13	O/P2 configure	CVBS	
PL18	O/P2 configure	B/U	
PL14	O/P3 configure	CVBS	
PL17	O/P3 configure	R/V	

Note: *Links marked with an asterisk are double links and care must be taken to ensure correct orientation.

Link positions (Audio)

Link	Function	Link 1-2	Link 2-3
PL19	Ch1 Gain	+18dBu	+24dBu
PL20	Ch2 Gain	+18dBu	+24dBu
PL21	Ch4 Gain	+18dBu	+24dBu
PL22	Ch3 Gain	+18dBu	+24dBu

Changing sync level

The output sync can be changed from the default of 300mV to approximately 2V for component modes that require large syncs with board link PL10. Place PL10 in the upper position for 2V and the lower position for 300mV.

Selecting SDI/analogue outputs

On rear connectors that support O/P 2, O/P 3, O/P 4 or O/P 5, either SDI or analogue video can be selected for each output with link pairs as shown in the link position summary table above. Output 1 is always Analogue and cannot be configured for SDI.

Adjusting analogue gains

The following gain adjustments are provided:

Variables	
P5 & 6	Analogue Video calibrate (factory set, not user adjustable)
P1	O/P 1 calibrate (factory set for 1.0V)
P2	O/P 2 calibrate (factory set for 1.0V)
P3	O/P 4 calibrate (factory set for 1.0V)
P4	O/P 3 calibrate (factory set for 1.0V)
P8	Analogue Audio Channel 2 Gain (factory set for =18dBu)
P9	Analogue Audio Channel 2 Gain (factory set for =18dBu)
P10	Analogue Audio Channel 3 Gain (factory set for =18dBu)
P11	Analogue Audio Channel 4 Gain (factory set for =18dBu)

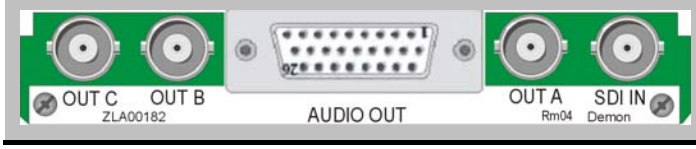
Note: All gains have been factory set and should not require any further adjustment.

2.2 Rear modules and signal I/O

The Indigo 4 4U frame takes up to 24 single height Crystal Vision modules, 12 single height modules will fit in the Indigo 2 2U frame, six single height modules will fit in the Indigo 1 1U frame and two will fit in the Indigo DT desk top box.

There are five types of rear connector available for the Indigo frames to provide system flexibility by allowing a mix between access to all connections and maximum module packing density.

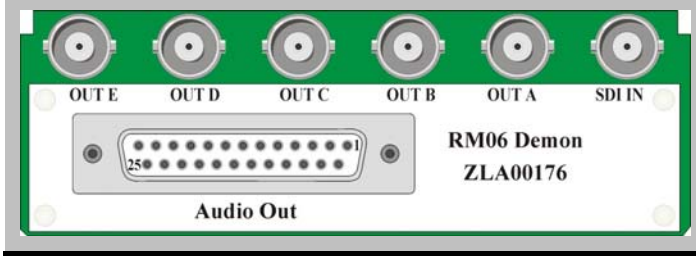
Rear module connections with RM04:

RM04. Fits in all frames	Description
	**RM04** • Up to 24 modules may be fitted in a single frame. • All frame slots can be used

	RGB	YUV	YC	CBVS
SDI IN	SDI In	SDI In	SDI In	SDI In
OUT A (O/P 1)	G	Y	YC-Y	CVBS
OUT B (O/P 2)	B	U	YC-C	CVBS / SDI loop
OUT C (O/P 3)	R	V	CVBS / SDI loop	CVBS / SDI loop

RM04 Audio Out Hi Density 26-way D-Type Connector							
1	GND	**8**	Ch4+	**15**	Sync	**22**	nc
2	Ch1+	**9**	GND	**16**	AES1-	**23**	GND
3	Ch1-	**10**	AES2+	**17**	AES1+	**24**	GND
4	Ch2+	**11**	nc	**18**	Ch4-	**25**	nc
5	Ch2-	**12**	AES2-	**19**	GND	**26**	nc
6	Ch3+	**13**	AES2+	**20**	GND		
7	Ch3-	**14**	AES1+	**21**	nc		

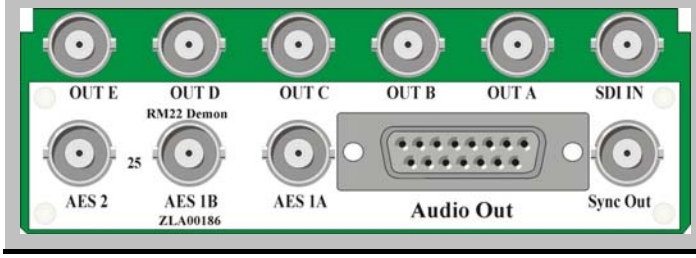
Rear module connections with RM06:

RM06. Fits in all frames	Description
	**RM06 (ZLA00176 artwork)** • 12 modules per 4U frame, 6 per 2U frame, 3 per 1U frame and 1 per DTB • 1 module per rear connector • 6 connections available • Card fits in upper slot • No card fits in lower slot

	RGB	YUV	YC	CBVS
SDI IN	SDI In	SDI In	SDI In	SDI In
OUT A (O/P 1)	G	Y	YC/Y	CBVS
OUT B (O/P 2)	B	U	YC-C	CVBS / SDI loop
OUT C (O/P 4)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT D (O/P 3)	R	V	CVBS / SDI loop	CVBS / SDI loop
OUT E (O/P 5)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop

Audio Out 25-way D-Type Connector							
1	GPI1	**8**	Ch4+	**15**	GPI4	**22**	AES2+
2	GPI3	**9**	AES1+	**16**	GPO2	**23**	nc
3	GPO1	**10**	Sync	**17**	GND	**24**	AES2-
4	GND	**11**	AES1-	**18**	Ch1+	**25**	AES2+
5	Ch2+	**12**	AES1+	**19**	Ch1-		
6	Ch2-	**13**	GND	**20**	Ch3+		
7	Ch4-	**14**	GPI2	**21**	Ch3-		

Rear module connections with RM22:

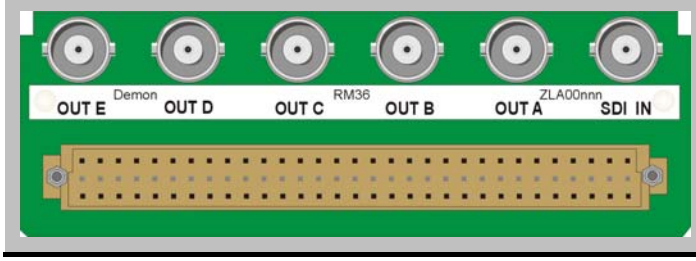
RM22. Fits in all frames	Description
	**RM22 (ZLA00186 artwork)** • 12 modules per 4U frame, 6 per 2U frame, 3 per 1U frame and 1 per DTB • 1 module per rear connector • 6 connections available • Card fits in upper slot • No card fits in lower slot

	RGB	YUV	YC	CBVS
SDI IN	SDI In	SDI In	SDI In	SDI In
OUT A (O/P 1)	G	Y	YC-Y	CVBS
OUT B (O/P 2)	B	U	YC-C	CVBS / SDI loop
OUT C (O/P 3)	R	V	CVBS / SDI loop	CVBS / SDI loop
OUT D (O/P 4)	CVBS / SDI loop	CVBS / SDI loop	CVBS/SDI loop	CVBS / SDI loop
OUT E (O/P 5)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
AES2	AES2	AES2	AES2	AES2
AES1B	AES1B	AES1B	AES1B	AES1B
AES1A	AES1A	AES1A	AES1A	AES1A
Sync Out	Sync Out	Sync Out	Sync Out	Sync Out

Audio Out 15-way D-Type Connector							
1	GND	**5**	Ch1+	**9**	nc	**13**	Ch2-
2	nc	**6**	Ch2+	**10**	nc	**14**	Ch4+
3	nc	**7**	Ch3+	**11**	GND	**15**	Ch4-
4	GND	**8**	Ch3-	**12**	Ch1-		

Rear module connections with RM36:

The RM36 is an “easywire” alternative to the RM06. Both rear modules share common video connections but the RM36 uses a DIN 41612 connector in place of the D-Type connector found on the RM06.

RM36. Fits in all frames	Description
	**RM36** • 12 modules per 4U frame, 6 per 2U frame, 3 per 1U frame and 1 per DTB • 1 module per rear connector • 6 connections available • Card fits in upper slot • No card fits in lower slot

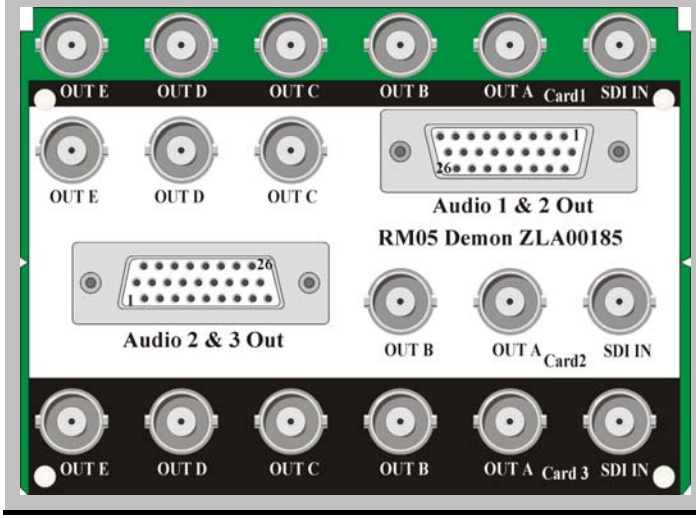
	RGB	YUV	YC	CBVS
SDI IN	SDI In	SDI In	SDI In	SDI In
OUT A (O/P 1)	G	Y	YC-Y	CBVS
OUT B (O/P 2)	B	U	YC-C	CVBS / SDI loop
OUT C (O/P 4)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT D (O/P 3)	R	V	CVBS / SDI loop	CVBS / SDI loop
OUT E (O/P 5)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop

RM36 Pin-out

DIN41612 pin-out.

	Pin number
No user connection	c1-3
GND	c4
CH1+	c5
CH1-	c6
GND	c7
CH2+	c8
CH2-	c9
GND	c10
CH3+	c11
CH3-	c12
GND	c13
CH4+	c14
CH4-	c15
GND	c16
GND	c17
GND	c18
No user connection	c19
Sync Out	c20
GND	c21
No user connection	c22
No user connection	c23
GND	c24
AES1-	c25
AES1+	c26
GND	c27
AES2-	c28
AES2+	c29
GND	c30
No user connection	c31-32
GND	a1
No user connection	a2-3
GND	a4
No user connection	a5-6
GND	a7
No user connection	a8-15
GPI 1	a16
GPI 3	a17
GPI 5	a18
GPI 2	a19
GPI 4	a20
GPI 6	a21
No user connection	a22-32

Rear module connections with RM05:

RM05 fits in Indigo 4 and Indigo 2 frames only	Description
	**RM05 (ZLA00185 artwork)** • 18 modules per 4U frame • 9 modules per 2U frame • 3 modules per rear connector • 6 connections available • Card 1 fits in slots 1, 5 and 9 • Card 2 fits in slots 2, 6 and 10 • Card 3 fits in slots 4, 8 and 12 • No card fits in 3, 7 or 11 • Not suitable for 1U frames or desk top boxes

With RM05 for card 1 (top slot)

Mode	RGB	YUV	YC	CBVS
SDI IN	SDI In	SDI In	SDI In	SDI In
OUT A (O/P 1)	G	Y	Y	CVBS
OUT B (O/P 2)	B	U	C	CVBS / SDI loop
OUT C (O/P 4)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT D (O/P 5)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT E (O/P 3)	R	V	CVBS / SDI loop	CVBS / SDI loop

Audio 1 & 2 I/O 26-way Hi-Density D-Type Connector							
1	GND	**8**	Ch4+	**15**	Sync	**22**	
2	Ch1+	**9**	GND	**16**	AES1-	**23**	
3	Ch1-	**10**	AES2+	**17**	AES1+	**24**	
4	Ch2+	**11**	nc	**18**	CH4-	**25**	
5	Ch2-	**12**	AES2-	**19**		**26**	
6	Ch3+	**13**	AES2+	**20**			
7	Ch3-	**14**	AES1+	**21**			

With RM05 for card 2 (second slot from top)

Mode	RGB	YUV	YC	CBVS
SDI IN	SDI In	SDI In	SDI In	SDI In
OUT A (O/P 1)	G	Y	Y	CVBS
OUT B (O/P 2)	B	U	C	CVBS / SDI loop
OUT C (O/P 4)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT D (O/P 5)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT E (O/P 3)	R	V	CVBS / SDI loop	CVBS / SDI loop

Audio 1 & 2 I/O 26-way Hi-Density D-Type Connector					
1	**8**	**15**		**22**	Ch2-
2	**9**	**16**		**23**	Ch3+
3	**10**	**17**		**24**	Ch3-
4	**11**	**18**		**25**	Ch4+
5	**12**	**19**	Ch1+	**26**	Ch4-
6	**13**	**20**	Ch1-		
7	**14**	**21**	Ch2+		

Audio 2 & 3 I/O 26-way Hi-Density D-Type Connector					
1	**8**	**15**		**22**	n/c
2	**9**	**16**		**23**	AES 1-
3	**10**	**17**		**24**	AES1+
4	**11**	**18**		**25**	AES 2-
5	**12**	**19**	AES 1+	**26**	AES2+
6	**13**	**20**	Sync		
7	**14**	**21**	AES 2+		

With RM05 for card 3 (third slot from top)

Mode	RGB	YUV	YC	CBVS
SDI IN	SDI In	SDI In	SDI In	SDI In
OUT A (O/P 1)	G	Y	Y	CVBS
OUT B (O/P 4)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT C (O/P 2)	B	U	C	CVBS / SDI loop
OUT D (O/P 5)	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop	CVBS / SDI loop
OUT E (O/P 3)	R	V	CVBS / SDI loop	CVBS / SDI loop

Audio 2 & 3 I/O 26 way Hi-Density D-Type Connector						
1	GND	**8**	Ch4+	**15**	Sync	**22**
2	Ch1+	**9**	GND	**16**	AES1-	**23**
3	Ch1-	**10**	AES2+	**17**	AES1+	**24**
4	Ch2+	**11**	N.C.	**18**	CH4-	**25**
5	Ch2-	**12**	AES2-	**19**		**26**
6	Ch3+	**13**	AES2+	**20**		
7	Ch3-	**14**	AES1+	**21**		

2.3 General Purpose Interface (GPI)

With GPI control enabled, remote switches can be used to recall any of the 16 stored preset configurations. The GPI lines are pulled up on-board to +5V via a 6k8Ohm resistor and can be used with closed-contact switches or +5V to +24V logic levels.

Each slot has an associated set of GPI connections for remote control and external status outputs on the frame rear-panel remote connectors. For convenience, GPI lines are associated with reference codes ‘a’ to ‘f’ in the connector pin-out tables for each frame.

The following table shows how the four GPI lines 'a' to 'd' are used as a four-bit binary code to select up to sixteen Demon 2 presets.

	GPI Functions				Op=open, Cl=closed (connect to ground)											
Preset	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
‘a’	Op	Cl	Op	Cl	Op	Cl	Op	Cl	Op	Cl	Op	Cl	Op	Cl	Op	Cl
‘b’	Op	Op	Cl	Cl	Op	Op	Cl	Cl	Op	Op	Cl	Cl	Op	Op	Cl	Cl
‘c’	Op	Op	Op	Op	Cl	Cl	Cl	Cl	Op	Op	Op	Op	Cl	Cl	Cl	Cl
'd'	Op	Op	Op	Op	Op	Op	Op	Op	Cl	Cl	Cl	Cl	Cl	Cl	Cl	Cl

Demon 2 presets are numbered from 1 to 16. So to recall the fifth preset the GPI lines need to assert a decimal value of 4. This only requires GPI line 'c' to be grounded with an external switch closure. So to recall the sixth preset, the decimal value five must be asserted. This will require both GPI lines 'a' and 'c' to be grounded at the same time. To recall preset 1, all four GPI lines should be open, for last preset (labelled 16) all GPI lines should be grounded.

The reason binary coding is used, is that it only requires four GPI lines to recall up to sixteen presets instead of sixteen separate lines.

Each frame slot has up to six connections ‘a-f’ for GPI control and monitoring. These connections are available at the rear of the frame on the 26-way D-Type remote connectors.

GPI	Preset		Low (<1V)	High (+5V)
1	‘a’	Preset Recall	Active	Non-active
2	‘b’		Active	Non-active
3	‘c’		Active	Non-active
4	‘d’		Active	Non-active
5	‘e’	Audio Alarms	Alarm condition	Non-alarm
6	‘f’	Video Alarms	Alarm condition	Non-alarm

As supplied, each GPI output has a 270Ω resistor in series with its output. This allows for an external LED to be driven, connected to a DC voltage of +5V.

GPI 5 and GPI 6 can be configured to show an alarm condition for any individual or group of error conditions. Configuring of the GPI reporting may be carried out from the board edge or either an active control panel or Statesman.

Reportable error conditions
Silence from any channel 1-4 of selected group for longer than set interval
Video input not present
Video picture black for longer than set interval
Video picture frozen for longer than set interval
EDH error/missing

Note: Audio channel silence, video black and frozen will, if flagged for an alarm, cause the alarm to be set following the delay period set by their respective delay controls. Loss of video and EDH error will be reported immediately.

4U frame GPI connections

GPI lines ‘a’ to ‘f’ of each card connect to two of eight rear remote connectors as follows:

Slot no.	‘a’ pin	‘b’ pin	‘c’ pin	‘d’ pin	‘e’ pin	‘f’ pin
1 (Upper)	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	8 (3)	9 (3)	18 (3)	26 (3)	19 (4)	20 (4)
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7	5 (3)	6 (3)	15 (3)	24 (3)	1 (4)	2 (4)
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11	3 (3)	12 (3)	22 (3)	21 (3)	12 (4)	13 (4)
12	10 (3)	11 (3)	19 (3)	20 (3)	21 (4)	22 (4)
Slot no.	**‘a’ pin**	**‘b’ pin**	**‘c’ pin**	**‘d’ pin**	**‘e’ pin**	**‘f’ pin**
1 (Lower)	8 (5)	9 (5)	18 (5)	26 (5)	19 (6)	20 (6)
2	7 (5)	16 (5)	17 (5)	25 (5)	10 (6)	11 (6)
3	8 (7)	9 (7)	18 (7)	26 (7)	19 (8)	20 (8)
4	7 (7)	16 (7)	17 (7)	25 (7)	10 (8)	11 (8)
5	5 (5)	6 (5)	15 (5)	24 (5)	1 (6)	2 (6)
6	4 (5)	14 (5)	13 (5)	23 (5)	3 (6)	4 (6)
7	5 (7)	6 (7)	15 (7)	24 (7)	1 (8)	2 (8)
8	4 (7)	14 (7)	13 (7)	23 (7)	3 (8)	4 (8)
9	3 (5)	12 (5)	22 (5)	21 (5)	12 (6)	13 (6)
10	10 (5)	11 (5)	19 (5)	20 (5)	21 (6)	22 (6)
11	3 (7)	12 (7)	22 (7)	21 (7)	12 (8)	13 (8)
12	10 (7)	11 (7)	19 (7)	20 (7)	21 (8)	22 (8)

Table shows pin number (remote number)

Note: Remote 1, Remote 3, Remote 5 and Remote 7 are 26 way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.

Remote 2, Remote 4, Remote 6 and Remote 8 are 26 way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2 and Remote 6.

Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A. Remotes 5-8 are similarly protected.

2U frame GPI connections

GPI lines ‘a’ to ‘f’ of each card connect to two of four rear remote connectors as follows:

Slot no.	‘a’ pin	‘b’ pin	‘c’ pin	‘d’ pin	‘e’ pin	‘f’ pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	8 (3)	9 (3)	18 (3)	26 (3)	19 (4)	20 (4)
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7	5 (3)	6 (3)	15 (3)	24 (3)	1 (4)	2 (4)
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11	3 (3)	12 (3)	22 (3)	21 (3)	12 (4)	13 (4)
12	10 (3)	11 (3)	19 (3)	20 (3)	21 (4)	22 (4)

Table shows pin number (remote number)

Note: Remote 1 and Remote 3 are 26 way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.

Remote 2 and Remote 4 are 26 way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2.

Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A.

1U frame GPI connections

GPI lines ‘a’ to ‘f’ of each card connect to the two rear remote connectors as follows:

Slot no.	‘a’ pin	‘b’ pin	‘c’ pin	‘d’ pin	‘e’ pin	‘f’ pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
4	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
5	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
6	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)

Table shows pin number (remote number)

Note: Remote 1: 26 way high-density D-Type female socket. Frame ground is pin 2 and +5V @500mA is pin 1.

Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15

Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

Indigo DT desk top box GPI connections

GPI lines ‘a’ to ‘f’ of each card connect to the two rear remote connectors as follows:

Slot no.	‘a’ pin	‘b’ pin	‘c’ pin	‘d’ pin	‘e’ pin	‘f’ pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)

Table shows pin number (remote number)

Note: Remote 1: 26 way high-density D-Type female socket. Frame ground is pin 2 and +5V @500mA is pin 1.

Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15

Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

3 Card edge operation

Once the start-up initialisation procedure is complete, the Demon 2 card can be controlled or configured from the card edge, the active control panel or the Statesman PC interface. This chapter will concentrate on the card edge controls.

The front edge of the card provides power rail monitoring, menu selection, and analogue audio monitoring output, rotary set-up controls and a ten-digit visual status display.

Demon 2 front edge view

The 8-way piano switch allows the operating modes, switching options and status options to be selected.

Lever	Function	Action
All UP	Status	General and audio control menus
1 Down	Data enter	Set DIP1 down then up to action a change
2 Down	Presets	Allows the selection of the 16 preset configurations
3 Down	Video	Video parameters
4 Down	Audio	Sets the routing of the audio outputs
5 Down	GPI	Error flag conditions
6 Down	Defaults	Reset etc.
7 Down	Not used	
8 Down	Recall	Set lever 8 down then up to recall a preset previously selected in the Preset menu (lever 2)

8-way piano switch menu functions

In general the menu piano switch is used to select one of five main menus, whilst the SEL rotary hex switch selects sub-menus or internal variables. The ADJ shaft encoder is used to assign values to variables (such as video parameters or routing assignments).

Piano lever 1 is reserved to action a change and lever 8 is used to recall one of the 16 sets of customer storable configurations.

Changes made using the shaft encoder are generally not implemented immediately. The display will normally flash alternately between bright and dim to indicate that the displayed value may no longer be current when the ADJ shaft encoder is turned. To save a new value simply toggle MENU switch 1 down and then up again.

General status and audio group select

All Menu piano switches in the **UP** position: -

SEL No.	Menu	Function and card edge display examples
0	**STATUS**	
1	SDI presence	Indicates the presence or absence of a serial digital video input. **IP pres, Vid IP absent**
2	Input standard	Indicates the line standard of the serial digital video input**. IP = PAL, IP = NTSC, Vid IP absent**
3	Input picture frozen	Indicates when the input picture is frozen. Note: To prevent false messaging there must be no movement in the picture for at least 5 seconds. **IP = NtFrz, IP = Froz, Vid IP absent**
4	Input picture Black	Indicates if the picture is black. The threshold for black is 0 ± 12.5mV **IP = NtBlk, IP = Black, Vid IP absent**
5	EDH present/missing	Indicates the presence or not of EDH information in the ancillary data. **EDH Pres, EDH Missing, Vid IP absent**
6	EDH Full field error	Indicates if the embedded Full field checkword matches the calculated checkword. **EDH FF Ok, EDH FF Err, EDH Missing, Vid IP absent**
7	EDH Active picture error	Indicates if the embedded Active picture checkword matches the calculated checkword. **EDH AP Ok, EDH AP Err, EDH Missing, Vid IP absent**
8	TRS monitor	Checks the validity of the 4-word timing reference signal in the composite digital input signal. **TRS OK, TRS Error, Vid IP absent**
9	Audio group with audio	Indicates which of the four audio groups within the serial digital video stream contain audio data. **Ip Gp 1-34** where **-** = no data.
A	Channel status	Shows which input channels of the selected group are active or silent. **Aud Op1s2s** where **s** = silent.
B	Audio marked for deletion	Indicates the presence of audio that has been flagged for deletion.
C	Non audio data present	Indicates the presence of Non audio data such as Dolby E.
D	Software level	The version of the current software fitted. **sware 1.0x**
E	Serial Number	Board serial number. **ser 654321**
F	GPI line test	Will show in binary format the status of the GPI lines ‘a’-‘d’.

Using presets

Menu piano lever 2 **DOWN**, all others in the **UP** position:-

SEL No.	Menu	Function and card edge display examples
0 to F	Preset	These menus allow the saving and recall of user presets. To save the current Demon 2 setup as a preset proceed as follows: • Select the required preset 1 to 16 with the Select switch (SW 3) • Press Menu lever 1 down then up to save the preset To recall a preset proceed as follows: • Select the required preset 1 to 16 with the Select switch (SW 3) • Press Menu lever 8 down then up to recall the preset Example: **P 15**

Note: It is recommended to disable GPIs when using the save or recall preset menu to prevent inadvertent GPI triggers from interfering with menu operation.
Presets can be controlled via the GPI inputs once GPIs have been enabled.

Setting video parameters

Menu piano lever 3 **DOWN**, all others in the **UP** position:-

SEL No.	Menu	Function and card edge display examples
0	**VIDEO**	
1	Test Pattern	Rotate [ADJ] shaft encoder to enable 75% bars. Menu lever 1 (press down then up) saves setting. **TPat Enable, TPat Disbl**
2	VBI	Passes vertical interval data to the composite outputs. Rotate [ADJ] shaft encoder to select. Menu lever 1 (press down then up) saves setting. **VBI Pass, VBI Blank**
3	Y Gain	Rotate [ADJ] shaft encoder to set the Y amplitude (80% to 120%). This control is common for composite Luma, YC-Y & YUV-Y. It will also affect the Luma content of the RGB output. The action is immediate. Example: **YGAIN 100**
4	U Gain	Rotate [ADJ] shaft encoder to set the U amplitude (80% to 120%). This control is common for composite Chroma, YC-C & YUV-U. It will also affect the Chroma content of the RGB output. The action is immediate. Example: **UGAIN 100**
5	V Gain	Rotate [ADJ] shaft encoder to set the V amplitude (80% to 120%). This control is common for composite Chroma, YC-C & YUV-V. It will also effect the Chroma content of the RGB output. The action is immediate. Example: **VGAIN 100**

SEL No.	Menu	Function and card edge display examples
6	Black level	Rotate [ADJ] shaft encoder to set the desired black offset level. The black level offset range is -7.5 to +15 IRE. In PAL and NTSC with no pedestal the range will be -7.5-0-15 IRE. In NTSC with pedestal the range will become 0 to 22.5 IRE. The increments are 0.5 IRE steps. Example: **BlOff 0.5**
7	NTSC pedestal	Enables (NTSC M) or disables (NTSC J) the 7.5 IRE pedestal for 525 line NTSC. Rotate [ADJ] shaft encoder to select. **NTSC-M, NTSC-J** Pedestal cannot be applied in 625 line PAL, **IP = PAL**
8	Component output selection	Enables the component output to be set for either YUV or RGB (note component output is link setting dependant). Rotate [ADJ] shaft encoder to select. **Op = RGB, Op = YUV**
9-D	Debug	There are a number of debug menus available, which are designed to help Crystal Vision technical support staff diagnose potential system problems associated with the inputs to the Demon 2 card. As such they are beyond the scope of this manual.
D-F	Not Used	No function assigned.

Routing audio channels

Menu piano lever 4 **DOWN**, all others in the **UP** position:-

SEL No.	Menu	Function and card edge display examples
0	**AUDIO**	
1	Audio Group	Rotate [ADJ] shaft encoder to select the audio group to be embedded for monitoring. Menu lever 1 (press down then up) to confirm selection. **Audio Grp-, Audio Grp1, Audio Grp2, Audio Grp3, Audio Grp4**.
2	Output Channel 1 Routing	Selects one of the four input sources in the currently selected group to be routed to Channel 1 output. Rotate [ADJ] shaft encoder to select input sources. Menu lever 1 (press down then up) saves setting. **Ip1 > Op1, Ip2 > Op1, Ip3 > Op1, Ip4 > Op1.**
3	Output Channel 2 Routing	Selects one of the four input sources in the currently selected group to be routed to Channel 2 output. Rotate [ADJ] shaft encoder to select input sources. Menu lever 1 (press down then up) saves setting. **Ip1 > Op2, Ip2 > Op2, Ip3 > Op2, Ip4 > Op2.**
4	Output Channel 3 Routing	Selects one of the four input sources in the currently selected group to be routed to Channel 3 output. Rotate [ADJ] shaft encoder to select input sources. Menu lever 1 (press down then up) saves setting. **Ip1 > Op3, Ip2 > Op3, Ip3 > Op3, Ip4 > Op3.**

SEL No.	Menu	Function and card edge display examples
5	Output Channel 4 Routing	Selects one of the four input sources in the currently selected group to be routed to Channel 4 output. Rotate [ADJ] shaft encoder to select input sources. Menu lever 1 (press down then up) saves setting. **Ip1 > Op4, Ip2 > Op4, Ip3 > Op4, Ip4 > Op4.**
6	Output 1 mute control	The channel 1 audio output can be muted by rotating the [ADJ] shaft encoder to select either muted or not muted. The action is immediate. **Op1 NonMut, Op1 Mute.**
7	Output 2 mute control	The channel 2 audio output can be muted by rotating the [ADJ] shaft encoder to select either muted or not muted. The action is immediate. **Op2 NonMut, Op2 Mute.**
8	Output 3 mute control	The channel 3 audio output can be muted by rotating the [ADJ] shaft encoder to select either muted or not muted. The action is immediate. **Op3 NonMut, Op3 Mute.**
9	Output 4 mute control	The channel 4 audio output can be muted by rotating the [ADJ] shaft encoder to select either muted or not muted. The action is immediate. **Op4 NonMut, Op4 Mute.**
A	Headphone Monitor	The stereo card edge headphone monitoring socket can be pointed to listen to either outputs 1 & 2 or outputs 3 & 4. Rotate [ADJ] shaft encoder to select output sources. Menu lever 1 (press down then up) saves setting. **HpMon Op12, HpMon Op34.**
B to F	Not Used	No function assigned

Note: It is possible to set the same source for any or all of the outputs if required. All four sources will always be from the same group as Demon 2 is unable to de-embed from more than one group at a time.

Using GPI lines

Menu piano lever 5 **DOWN**, all others in the **UP** position:-

SEL No.	Menu	Function and card edge display examples
0	GPI	
1	Audio alarm status	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 5. The action is immediate. **AudMis Flg, AudMis Msk**
2	Silence stereo 1 left detect	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 5. The action is immediate. **Sil L1 Flg, Sil L1 Msk**
3	Silence stereo 1 right detect	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 5. The action is immediate. **Sil R1 Flg, Sil R1 Msk**
4	Silence stereo 2 left detect	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 5. The action is immediate. **Sil L2 Flg, Sil L2 Msk**
5	Silence stereo 2 right detect	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 5. The action is immediate. **Sil R2 Flg, Sil R2 Msk**
6	Frozen input video	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 6. The action is immediate. **IpFroz Flg, IpFroz Msk**
7	Input video black	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 6. The action is immediate. **IpBlck Flg, IpBlck Msk**
8	Input video present	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 6. Menu lever 1 (press down then up) saves the setting. **IpMiss Flg, IpMiss Msk**
9	EDH Full field error	Rotate [ADJ] shaft encoder to flag or mask warning via GPO 6. The action is immediate. **EDH FF Flg, EDH FF Msk**
A	Silence detect delay	Rotate [ADJ] shaft encoder to set the required delay time (0-240 sec) before a flagged silence alarm is actioned. **DelSil 30**
B	Frozen detect delay	Rotate [ADJ] shaft encoder to set the required delay time (0-240 sec) before a flagged frozen alarm is actioned. **DelFro 30**
C	Black detect delay	Rotate [ADJ] shaft encoder to set the required delay time (0-240 sec) before a flagged black alarm is actioned.. **DelBlk 30**
D	GPI recall of presets control	Enables or disables the GPI lines ‘a’-‘d’ for use as Preset recall. **GPI Enable, GPI Disabl**
E to F	Not Used	No function assigned

Note: Silence detect allows the masking or flagging of any silence on input channel 1 to 4 of the selected group. If a period of silence that exceeds the period of time set by the Audio Silence Delay is detected and the flag is set, a warning will be set on GPO 5.
Black detect is used to flag or mask missing luminance in the incoming SDI. If the flag is set and luminance is within ± 12.5 mV of digital black for a period of time set by the Video Absence Delay a warning will be set on GPO 6.
Video absence if flagged will set a warning on GPO 6 immediately.

Defaults

Menu piano lever 6 **DOWN**, all others in the **UP** position:-

SEL No.	Menu	Function and card edge display examples
0	DEFAULTS	
1	Reset	Resets all parameters to their factory values and erases all stored presets
2	Default	Resets all parameters to their factory values but retains all stored presets
3 to F	Not Used	No function assigned

Parameter	Default value
Gains and levels	0 or 100% as applicable.
Delays	30 seconds
Component Output	RGB
Test pattern	Off
VBI	Blanked
NTSC Setup	Not applied
Audio Group	Group 1
Audio Routing	Ch1>Ch1, Ch2>Ch2, Ch3>Ch3, Ch4>Ch4
Audio channels	Not muted
Headphone output	Output 1-2
Alarms	All masked

4 Using the active front panel

4.1 Module selected

This operational guide assumes that the panel has been setup according to the panel set-up procedure described in the Crystal Vision Control Panel manual.

Note: It is **ESSENTIAL** that the Panel set-up procedure is followed and any old or unknown passwords cleared prior to using the panel for the first time.

At power up, the two line 20-character screen will display 'Crystal Vision' followed by the firmware version number for the control panel. All eight control panel keys LEDs will illuminate.

The Crystal Vision control panel start up display

'Control Panel' then briefly replaces the version number display.

If the control panel firmware has been updated for Statesman control (version 1.5.0 or higher), Statesman Mode will be entered and the message, 'Press CAL to Exit' will be displayed and the CAL LED will light.

Statesman mode is entered by default

To continue with control panel operation or configuration, press the CAL key once. A second press of the CAL key will return to Statesman control.

The control panel will display the name of the card that first responds to the polling request together with its location number.

The location number consists of the frame number plus the card position in the frame.

Navigating the display

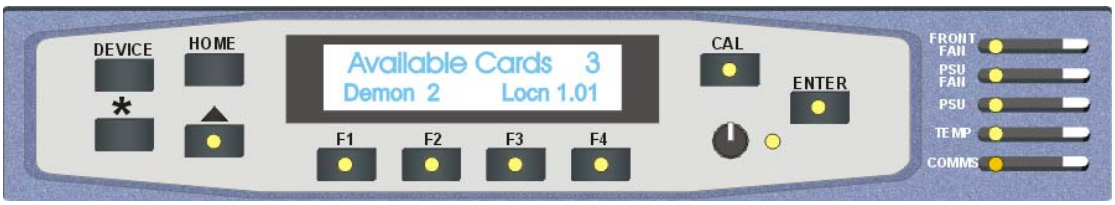
The functions assigned to control panel keys are:

- DEVICE – enters Device menu to select a card or show cards available / enters Panel setup when held down during power up / shows frame status when pressed from Statesman mode
- CAL – enters or leaves Statesman mode / enters panel diagnostics mode when held down during power up / updates the display
- Asterisk – enters board rename menu from the Device menu
- F1 to F4 – soft keys, function assigned within each menu
- HOME – moves the display to the home menu
- ENTER – accept current selection
- Upward arrow – used to move up the menu structure / enter lock panel menu from the Device menu
- Rotary control – shaft encoder used to select options or variable data

Note: Please refer to the Crystal Vision Control Panel manual for details of the Panel Setup, Lock Panel and Diagnostic menus.

Selecting Demon 2

To select a particular card in a frame, press the DEVICE key to go to the Device menu. The top line of the display will show 'Available Cards X', where X is the number of cards that have responded so far to the polling request.



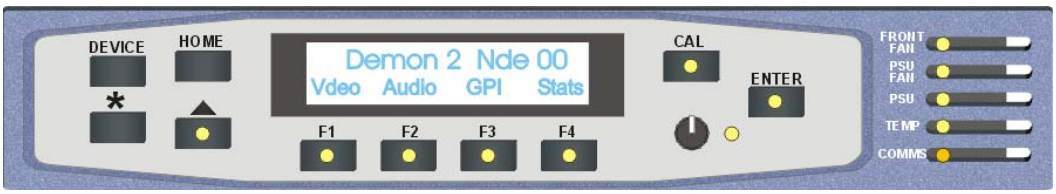
The available cards menu

Rotate the shaft encoder and the bottom row will display the successfully polled cards by name and location or slot number.

In the example above, the card displayed is located in the first frame in slot number 3.

When the desired card is selected press the ENTER key to access that card's HOME menu.

The message shows that a Demon 2 has been selected.



The Demon 2 home menu

Updating the display

The values displayed on an active front panel are only updated when an adjustment is made and when changing menu level. If changes occur through the use of card edge controls or other remote control, the text displayed on the active front panel will not be updated immediately. If necessary, use the upward arrow to leave and then re-enter a menu to update the display.

4.2 The Demon 2 active panel menu structure

At any time the main top-level menu (Home) is obtained by pressing the HOME key. From the home menu further selections can be made. Active function keys are indicated by illuminated, integrated LEDs.

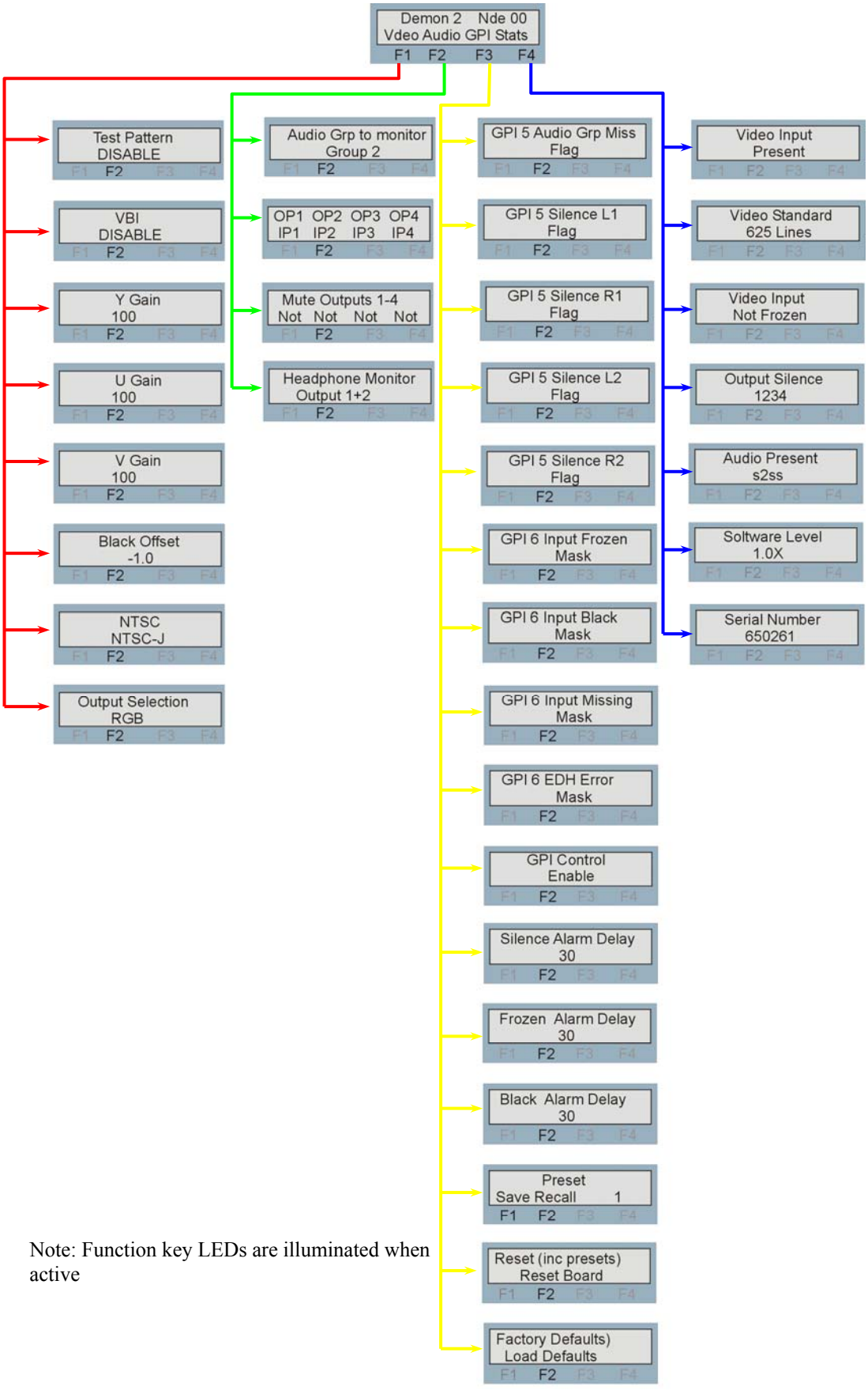
The main top-level menus for the Demon 2 module are obtained by pressing the F1- F4 keys from the HOME menu. Menu keys are illuminated when active and when further menus are available. The top-level menus are:

- Video (Gains and formats) – press F1
- Audio (Group to be monitored, routing and monitoring) – press F2
- GPI (Configure Frozen, Black and Silence delays and alarm reporting) – press F3
- Stats (Status) – press F4

When a sub menu has been selected, further options may be obtained by using the Shaft control to scroll through them. Once the desired option has been located a selection or value change can be made by either toggling the appropriate function key or by selecting and using the shaft control to alter a numerical value. A configuration change or value will be activated as the shaft control is rotated or function button is toggled. The variable being adjusted will appear in brackets. Pressing Enter will fix the new value.

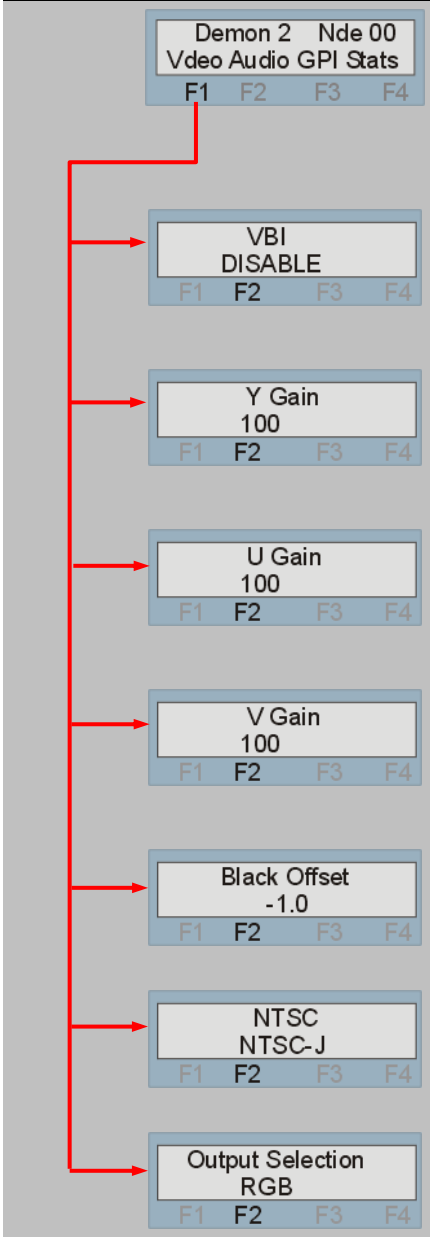
The following chart shows the available Demon 2 menus. The actual menus available may vary slightly as software is updated.

Demon 2 Menu Structure



Note: Function key LEDs are illuminated when active

Video Control Menu

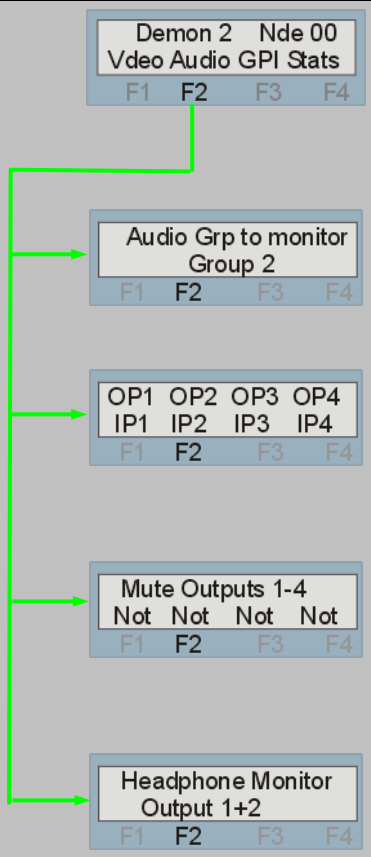
Demon 2 Video control menu	Description
	From the Home menu, press F1 to select the Video menu, which is then traversed by rotating the shaft control. Rotate shaft encoder to select VBI enable/disable. Press F2 to select to change the value. Rotate shaft encoder to set the new value. Press enter to accept the new value. Rotate shaft encoder to select the Y Gain. Press F2 to select to change the value. Rotate shaft encoder to set the new value (80-120%). Press enter to accept the new value. Rotate shaft encoder to select the U Gain. Press F2 to select to change the value. Rotate shaft encoder to set the new value (80-120%). Press enter to accept the new value. Rotate shaft encoder to select the V Gain. Press F2 to select to change the value. Rotate shaft encoder to set the new value (80-120%). Press enter to accept the new value. Rotate shaft encoder to select Black offset. Press F2 to select to change the value. Rotate shaft encoder to set the new value. Press enter to accept the new value. Rotate shaft encoder to select NTSC format. Press F2 to select to change the value. Rotate shaft encoder to set the new value, Press enter to accept the new value. Rotate shaft encoder to select the Component format. Press F2 to select to change the value. Rotate shaft encoder to set the new value. Press enter to accept the new value.

Note: The Y, U and V gain controls are common to the Composite, Y/C, YUV and RGB outputs.

The total black level offset range is -7.5 to +15 IRE for both PAL and NTSC. For NTSC with no pedestal the range will be -7.5-0-15 IRE, with pedestal the range will become 0 to 22.5 IRE. The increments are in steps of 0.5 IRE.

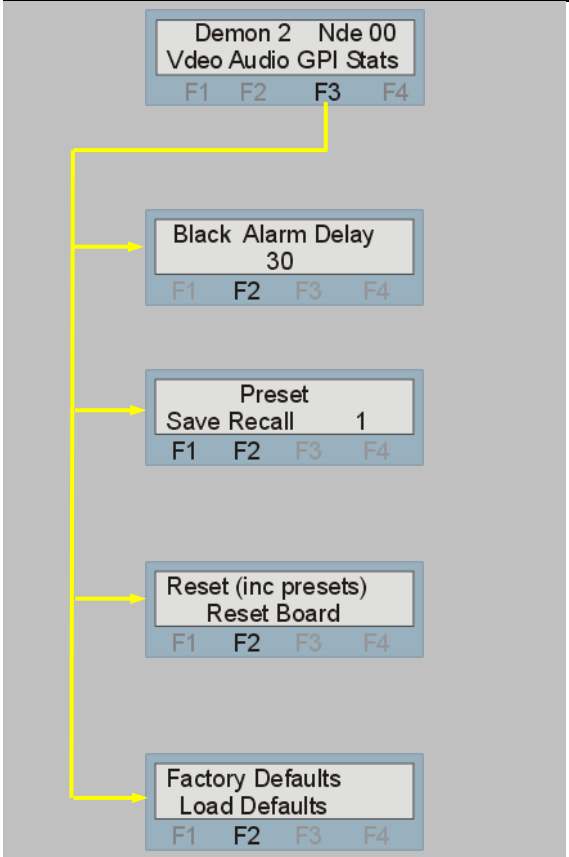
Audio configuration menu

The audio control menu gives access to the routing and monitoring controls.

Demon 2 Audio control menu	Description
	From the Home menu, press F2 to select the Audio menu, which is then traversed by rotating the shaft control. Rotate shaft encoder to select Audio group. Press F2 to select to change the value. Rotate shaft encoder to set the new group. Press enter to accept the new value. Rotate shaft encoder to select Output Routing. Press F2 to select to change the value. Press F1-4 to select Output to be routed Rotate shaft encoder to set the new routing. Press enter to accept the new value. Rotate shaft encoder to select Mute output. Press F2 to select to change the value. Press F1-4 to select Output to be routed Rotate shaft encoder to set the new value. Press enter to accept the new value. Rotate shaft encoder to select the Headphone monitor. Press F2 to select to change the value. Rotate shaft encoder to set the new routing. Press enter to accept the new value.

Configuring GPIs

Pressing F3 from the home menu will bring up the GPI menu. The GPI menu provides access to the various GPI configuration, delay and reset sub-menus. Rotate the shaft encoder to select each sub-menu and also change parameters.

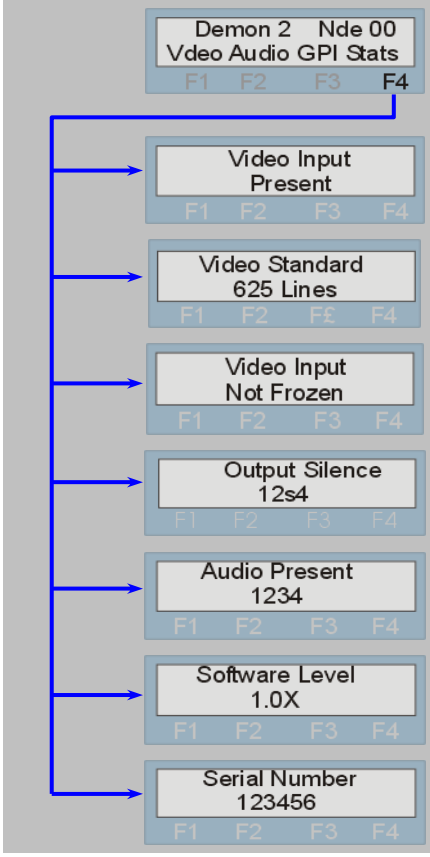
Demon 2 GPI control menu	Description
	From the Home menu, press F3 to select the GPI menu, which is then traversed by rotating the shaft control. Rotate shaft encoder to select Black Alarm delay. Press F2 to select to change the value. Rotate shaft encoder to set the new value (0-240sec). Press enter to accept the new value. Rotate shaft encoder to select the Preset menu. Press F1 or F2 to select to change the value. Rotate shaft encoder to select location. Press F1 to save configuration. Press F2 the recall the configuration Rotate shaft encoder to select Reset. Press F2 to select. Press F3 to confirm. All values will be reset to their default values and all presets erased. Rotate shaft encoder to select Factory Default. Press F2 to select. Press F3 to confirm. All values will be reset to their default values. All preset configurations will be retained.

Delay times are variable in one-second steps from 0 to 240 seconds. Pressing CAL at any time will return the delay to the default value of 30 seconds. If ENTER is not pressed to accept the changed value it will revert to the value last saved.

Parameter	Default value
Gains and levels	0 or 100% as applicable
Delays	30 seconds
Component Output	RGB
Test pattern	Off
VBI	Blanked
NTSC Setup	Not applied
Audio Group	Group 1
Audio Routing	Ch1>Ch1, Ch2>Ch2, Ch3>Ch3, Ch4>Ch4
Audio channels	Not muted
Headphone output	Output 1-2
Alarms	All masked

Status

The status menu contains various information about the board and the video input.

Demon 2 status menu	Description
	From the Home menu, press F4 to select the status menu, which is then traversed by rotating the shaft control. Rotate the shaft control to view the video input status. Rotate the shaft control to view the video standard. Rotate the shaft control to view the picture status. Rotate the shaft control to view the audio channel status. Rotate the shaft control to view the audio group status. Rotate the shaft control to view the software version. Rotate the shaft control to view the serial number.

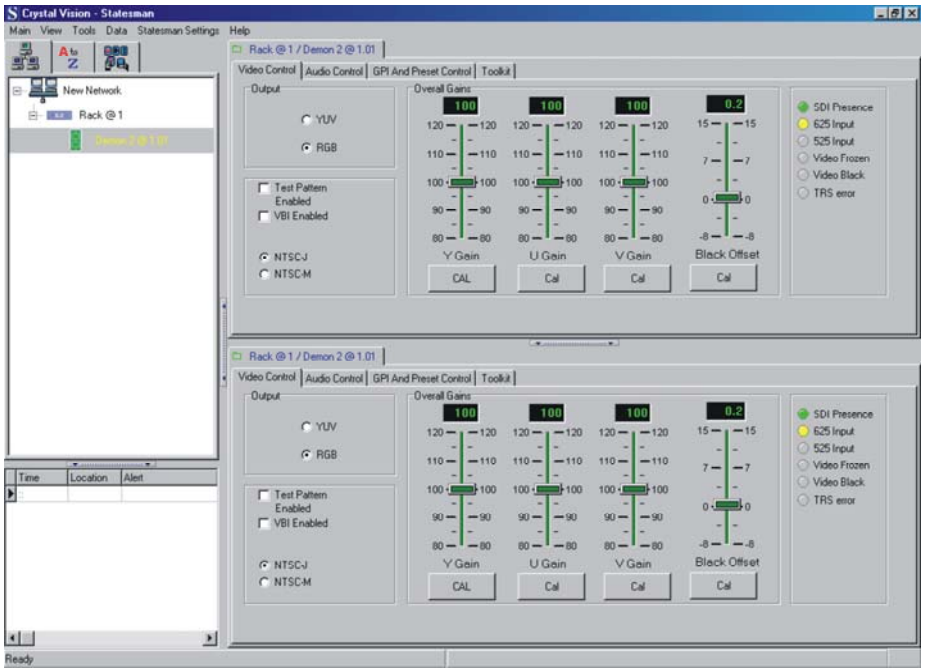
5 Statesman

The Crystal Vision Statesman PC control software is designed to control a range of Crystal Vision modules via serial control from a PC. Statesman provides a user friendly means of configuring and operating Crystal Vision modules with the benefit of "see-at-a-glance" status monitoring.

The main Statesman application communicates with each module in a frame through an active control panel. An active panel must be fitted to allow for Statesman control.

5.1 Statesman operation

The initial view will show an Explorer style view of the connected frames and modules. Double-clicking on a module will enable the display of the main application menus.



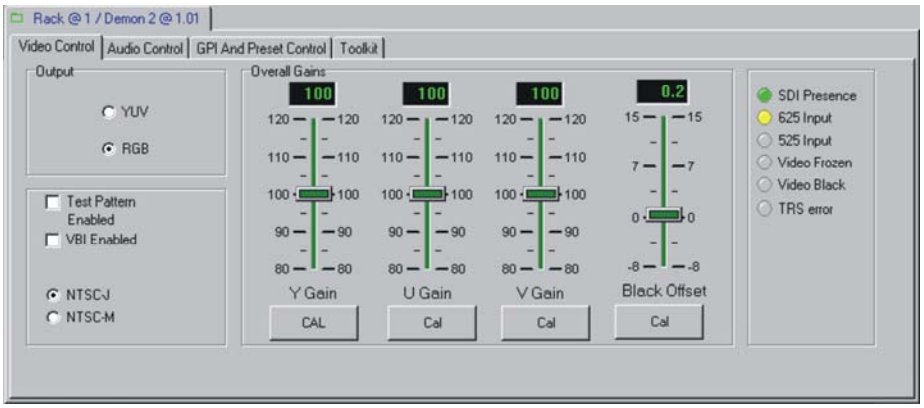
The Statesman main application window

The menu display is repeated for convenience to allow dual-control display of modules with duplicate signal paths or to allow two functions to be viewed at the same time.

Demon 2 has four Statesman menu tabs that provide status information, allow configuration of delay and gains, and are also for assigning the GPI outputs.

Video Controls

The Video control pane is divided into four group boxes, which show output configuration, test pattern / VBI configuration and NTSC pedestal, overall gains and black offset, and input video status.



Demon 2 Video control and status menu

Output

The component output mode is selected here by ticking the appropriate radio button.

Test pattern / VBI configuration and NTSC pedestal

This group box is where the user can select the output to show a colour bars test pattern, elect to pass or blank information carried in the vertical interval, or add a 7.5 IRE pedestal to the composite output when an NTSC output is present. Any of these actions are carried out by checking the appropriate radio button or check box.

Overall gains and Black offset

These four controls allow adjustment of the video output encoder. Changes can be made in several ways, the simplest being to click and drag the slider cross bar. It is also possible to simply click on a part of the scale to cause the slider cross bar to jump to that position. The numerical value may also be edited by highlighting and over typing.

All values may be returned to their default value by clicking their respective CAL buttons.

The total black level offset range is -7.5 to +15 IRE for both PAL and NTSC. For NTSC with no pedestal the range will be -7.5-0-15 IRE, with pedestal the range will become 0 to 22.5 IRE. The increments are in steps of 0.5 IRE.

Note: The Y, U and V gain controls are common to the Composite, Y/C, YUV and RGB outputs.

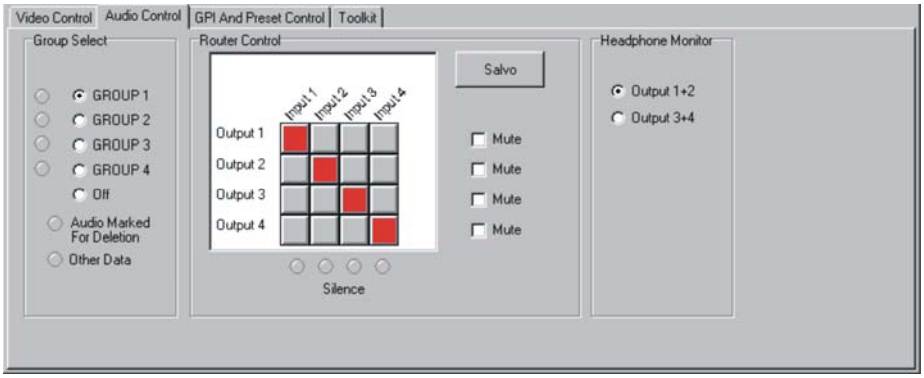
Input video status

This group box gives a simple overview of the input video status by the use of simulated LEDs. All these indicators will change state either almost immediately or after a small delay to prevent alarm conditions being triggered due to transitory conditions.

The video frozen and video black warning LEDs will react nearly immediately independently of the video frozen and video black delay control settings.

Audio Controls

The Audio control pane is divided into three group boxes that allow the selection of the audio group to be de-embedded, input to output routing and headphone monitor routing.



Demon 2 Audio controls menu

Group select

The left-hand LEDs indicate which of the four groups within the SDI stream contain data. This data could be digital audio or other non-audio data. A group for de-embedding is selected by checking the appropriate radio button. If the selected group contains non-audio data or is flagged for future deletion the ‘Audio Marked For Deletion’ or ‘Other Data’ LEDs will illuminate.

Note: As Demon 2 has only a single de-embedder only a single group may be de-embedded at a time so all channels of interest must be contained within the same group.

Router control

The central section is assigned to routing and control. At its heart is a 4 x 4 routing matrix that allows any of the four outputs to be routed to any input. It also has the ability to connect any number of outputs to any single input. Connecting an output to multiple inputs are not permitted.

The router follows the normal convention in that a routing pattern, indicated by the button changing to brown, is set up without affecting the current configuration followed by the Salvo command. Once a configuration is active the buttons will show red.

Further controls allow the outputs to be individually muted and inverted. An LED will also indicate if an input channel is silent. The silence indication is almost immediate and is not affected by the silence detect delay setting.

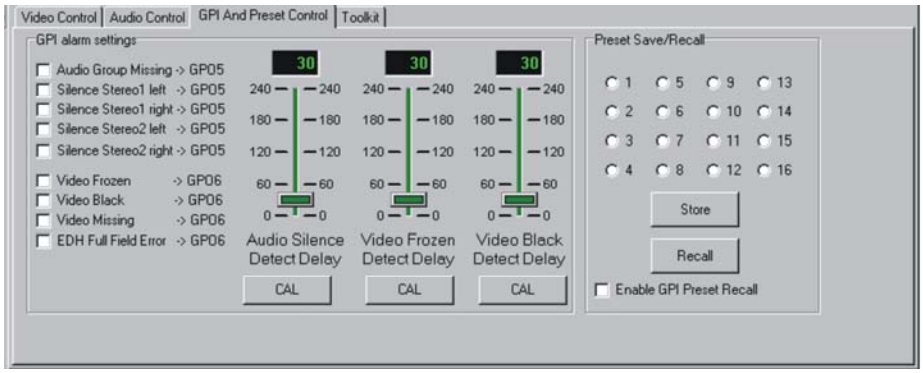
Headphone monitor

The stereo headphone socket on the board edge can be used to monitor input pairs. Pairs 1-2 and 3-4 can be selected by checking the appropriate radio button.

Note: The headphone output is a high impedance drive that may be used to drive high impedance headphones or an active speaker system.

GPI and Preset controls

The GPI and Preset control menu gives access to the user configurable alarms and assert delays. Access to the 16 storable user setup configurations is also found here.



Demon 2 GPI and Preset control menu

GPI alarm settings

This section is used to configure the GPI outputs 05 and 06. The alarms can be flagged or masked according to which tick boxes have been checked.

Note: Any number of tick boxes may be checked. The operator is then required to determine the exact cause of the alarm by further interrogation.

Delay settings

These three controls allow the setting of the Audio Silence, Video Frozen and Video Black detect delay time. These delay settings determine the time delay for which an attribute must be outside its parameters before an alarm is triggered. Changes can be made in several ways, the simplest being to click and drag the slider cross bar. It is also possible to simply click on a part of the scale to cause the slider cross bar to jump straight to that position. The numerical value may also be edited by highlighting and over typing.

All values may be returned to their default value (30 seconds) by clicking their respective CAL buttons.

Saving and recalling presets

The current board settings (i.e. routing and delay) can be saved in one of 16 locations to be recalled as desired. Therefore this allows the user to store and recall up to 16 different configurations.

To save the current settings, tick the selected preset location and click on Store. This will write the current settings into this location.

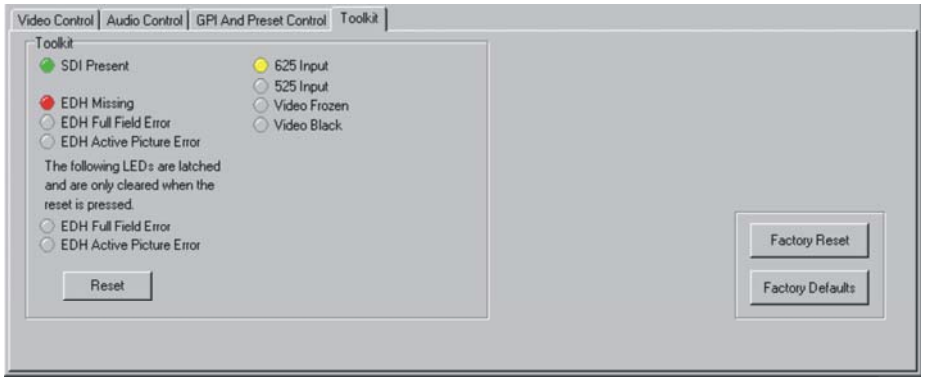
Note: If the selected location contains previously saved setting information it will be over-written by the new setting data.

To recall previously stored setting information, again tick the selected location and click Recall.

The recalling of previously stored presets can also be implemented externally via the GPI port. To sanction this facility, tick the 'Enable GPI preset recall' box.

Toolkit

This pane contains the EDH monitoring along with the Default and Reset buttons. The video status indicators are also repeated here for convenience.



Demon 2 Toolkit menu

EDH status

EDH missing, EDH full field error and active picture error is monitored. Their status LED indicators will change colour to show condition. EDH full field error and active picture error also have a latched indicator to show if a transitory error has occurred.

Signal status

The Input Present indicator will illuminate green when a valid input is present or red if the input is missing.

The video standard is automatically detected and is shown by a yellow indicator.

The audio group for monitoring is selected from this pane by checking the appropriate radio button. Indication is also given of the channel status within that group.

Further status information is provided by the Statesman logging and alarms feature, which is described in more detail in the Statesman manual.

Factory Default and Reset

Pressing the Factory Default button will return all parameters to their default values. Any user configurations saved as presets will be retained.

Factory Reset will also return all parameters to their default value but will also erase all stored presets.

Parameter	Default value
Gains and levels	0 or 100% as applicable.
Delays	30 seconds
Component Output	RGB
Test pattern	Off
VBI	Blanked
NTSC Setup	Not applied
Audio Group	Group 1
Audio Routing	Ch1>Ch1, Ch2>Ch2, Ch3>Ch3, Ch4>Ch4
Audio channels	Not muted
Headphone output	Output 1-2
Alarms	All masked

6 Trouble shooting

The front edge of the card provides useful power rail monitoring, in addition to card edge controls and a headphone monitoring output.

Demon 2 front edge view

The top green LED indicates good +/-18 Volt power rails when lit and the lower green LED indicates a good +5 Volt rail when lit.

The headphone output is a useful way of monitoring the presence and quality of audio through the Demon 2 module. Refer to the card edge section for details of its use.

There is also an AES and Analogue audio monitor output from the remote connector at the rear of the frame. Details of the pinout for these signals can be found in the Installation chapter.

Basic fault finding guide

The Power OK LEDs are not illuminated

Check that the frame PSU is functioning – refer to the appropriate frame manual for detailed information

There is no video output

Check that a valid SDI is present and that any cabling is intact

The video output is SDI when an analogue video output is expected

Check that the link jumper settings are correct for the rear connector in use as explained in the Installation Chapter

The video output exhibits jitter

Check that the input SDI stability is within normal limits

There is no audio output

Check that audio is present in the incoming SDI signal and that any cabling is intact

Check that the selected group contains valid audio

Check that the de-embedded audio is valid, active and is routed correctly

Check that the output channel has not been muted

The card no longer responds to card edge or front panel control

Check that the card is seated correctly and that the Power OK LEDs are lit

Check any active control panel cabling

Check if the control panel can control another card in the same rack

If necessary re-set the card or apply a factory reset as explained in the Operation Chapter

Can a Demon 2 card be used with the same remote connector wiring for audio monitoring as a Tandem module?

Certain audio monitoring signals have been duplicated to enable this

Is it safe to ground either the positive or negative audio output for unbalanced operation?

No. This is unsafe. An unbalanced output may be obtained by using the +ve of an audio signal pair with the unbalanced return connected to ground

Re-setting the card

It is possible to recall factory default settings from any control interface used to operated Demon – please refer to the appropriate section for your control interface

If required, the card may be reset by removing the card from the rack and then re-inserting it

It is safe to re-insert the card whilst the rack is powered

7 Specification

General

Dimensions	100mm x 266 mm module with DIN 41612 connector
Weight	200g
Power consumption	6.5 W

Inputs

Video	1 x SDI 270Mbit to EBU 3267-E & SMPTE 259M
	Cable equalisation >200m Belden 8281 or equivalent
	Input Return Loss : >15 dB at 270MHz
	Auto or Manual 625/525 line selection
	Automatic de-embedding of SMPTE or Sony format

Outputs

Number and type:	There is a maximum of 5 Video outputs, which can be a selection of both analogue and SDI. The final configuration will depend on the selected rear module.
SDI Performance:	As per EBU 3267-E & SMPTE 259M
Output Return Loss:	>15db at 270MHz
Component:	YUV and GBR 1 Volt ±2% into 75ohm. sync on G, B & R
Composite:	1V ±2% with sync into 75ohm

Component performance

Processing:	Video input is 10 bit processed for 12 bit output DACs
Frequency response:	Luminance: +/- 0.3dB to 5.5 MHz.
	Chrominance: +/- 0.4dB to 2.5 MHz
Noise:	<-67dB weighted luminance or chrominance
Gain error:	< 1%

Composite performance

Processing:	Video input is 10 bit processed for 12 bit output DACs
Frequency response:	Luminance: +/- 0.3dB to 5 MHz
	Chrominance: +/- 0.4dB to 2.5 MHz
Noise:	<-67dB weighted luminance or chrominance
Differential gain:	< 2% typ
Differential phase:	+/- 1° typ
VBI:	Conforms to standard digital decompression dimensions
	PAL lines 6 to 22 and 318 to 335. NTSC lines 10 to 20 and 272 to 283

Sync output:	300mV or approx 2V sync with no burst (Link selectable)

Audio outputs

Number and type:	2 analogue stereo pairs or 4 mono channels. Low output impedance (66Ohm) balanced 2 x 20 bit AES/EBU stereo pairs 110Ohm balanced or 75ohm unbalanced
Output level range:	0dBFS = +28dBu max. / 0dBFS = +12dBu min. Factory set default: 0dBFS = +18dBu or +24dBu by on board jumper link setting

Audio performance

Frequency Response:	20Hz to 20KHz within +/- 0.1 dB
Signal to noise:	Better than -82dBu / -100dBFS (+18dBu) rms. 22Hz to 22kHz typ
Dynamic Range:	100dB
Total Harmonic Distortion:	Less than 0.005% THD+N rms. 22Hz to 22kHz typ
Interchannel Crosstalk:	-112dB at 1 kHz, -98dB at 20kHz, rms. typ
Audio to video alignment timing:	Within +/- 2.0 mS

Audio monitoring

3.5mm jack	1 x miniature front mounting audio jack. Switch selected for individual stereo audio monitoring

Status monitoring

LED/Alphanumeric display	Front of card edge visual monitoring with alphanumeric and LED indicators to indicate: PSU rails present: LED SDI input: Alphanumeric display AES audio input: Alphanumeric display Audio silence: Alphanumeric display

GPI inputs

Number and type:	4 x GPI inputs allowing the recall of 16 presets

GPI outputs

Number and type:	2 x GPI outputs, Loss of Video & Silence/Loss of Audio, Video frozen/Black, EDH error

Test patterns

Type:	100% EBU Colour bars

Input fail output

Type: Blue